

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions of claims in the application.

1. (Currently amended): A film lamination method for laminating a film on a principal surface of a semiconductor substrate by using a rotatable roller having a diameter of about 20-50mm, a heat-generating part therein and an elastically deformable resin layer on an outer surface thereof, the film lamination method comprising:

pressing the roller onto the film placed on the principal surface of the semiconductor substrate while generating heat by the heat-generating part; [[and]]

rolling the roller on the film so as to laminate the film on the semiconductor substrate by heat from the heat-generating part while absorbing unevenness of the outer surface of the roller and unevenness of a surface of the film by elastic deformation of the elastically deformable resin layer; and

wherein said roller presses the film with a pressing load of 10-20N.

2. (Previously presented): The film lamination method as claimed in claim 1, wherein said roller includes a cylindrical metal body and the resin layer formed on an outer surface of the cylindrical metal member, and wherein the heat-generating part is provided in a central portion of the cylindrical metal member so as to extend in an axial direction of the cylindrical metal member.

3. (Original): The film lamination method as claimed in claim 2, wherein said resin layer is formed of a fluoride resin.

4. (Withdrawn): The film lamination method as claimed in claim 1, wherein said roller is a cylindrical elastic member, and a plurality of heat-generating parts are arranged near an outer surface of the cylindrical elastic member.

5. (Withdrawn): The film lamination method as claimed in claim 4, wherein said cylindrical elastic member is made of rubber or plastic.

6. (Withdrawn): The film lamination method as claimed in claim 1, wherein said roller includes a plurality of short rollers each having a width smaller than a width of said semiconductor substrate so that the film is laminated on the semiconductor substrate by pressing the plurality of short rollers sequentially on the film placed on the principal surface of the semiconductor substrate and rolling the short rollers on the film.

7. (Withdrawn): A film lamination method for laminating a film on a principal surface of a semiconductor substrate by using a table supporting the semiconductor substrate and a rotatable roller, the table having a plurality of heat-generating parts therein, the film lamination method comprising pressing the roller onto the film placed on the principal surface of the semiconductor

substrate and rolling the roller on the film while selectively activating the heat-generating parts in response to a movement of the roller so as to laminate the film on the semiconductor substrate by heat from the heat-generating parts.

8. (Withdrawn): The film lamination method as claimed in claim 7, wherein said heat-generating parts are arranged so as to be parallel to a direction perpendicular to a laminating direction and thermally isolated from each other.

9. (Withdrawn): A film lamination method for laminating a film on a principal surface of a semiconductor substrate by using a rotatable roller and a table supporting the semiconductor substrate, a heat-generating part being movably provided under the table, the film lamination method comprising pressing the roller onto the film placed on the principal surface of the semiconductor substrate and rolling the roller on the film while moving the heat-generating part in response to a movement of the roller so as to laminate the film on the semiconductor substrate by heat from the heat-generating part.

10. (Withdrawn): A film lamination apparatus comprising:
a table on which a semiconductor substrate to be processed is placed and fixed; and
a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film,

wherein said roller includes:

a cylindrical metal member;

a heat-generating part provided in the cylindrical metal member; and

a resin layer covering an outer surface of said cylindrical metal member.

11. (Withdrawn): A film lamination apparatus comprising:

a table on which a semiconductor substrate to be processed is placed and fixed; and

a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film,

wherein said roller includes:

a cylindrical elastic member; and

a heat-generating part provided in the cylindrical elastic member.

12. (Withdrawn): A film lamination apparatus comprising:

a table on which a semiconductor substrate to be processed is placed and fixed; and

a roller assembly having a plurality of short rollers each pressing an attachment film onto the semiconductor substrate while rolling on the attachment film,

wherein said roller assembly includes a plurality of heat-generating rods parallel to a direction perpendicular to a laminating direction, the heat-generating rods provided with

cylindrical metal members, respectively, so that parts of the cylindrical metal members overlap with each other in an axial direction of the heat-generating rods.

13. (Withdrawn): A film lamination apparatus comprising:
a table on which a semiconductor substrate to be processed is placed and fixed;
a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film; and
a heat-generating part provided in said table, wherein the heat-generating part is divided into a plurality of small heat-generating parts arranged in a direction of movement of the roller.

14. (Withdrawn): A film lamination apparatus comprising:
a table on which a semiconductor substrate to be processed is placed and fixed;
a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film; and
a heat-generating part provided under said table, the heat-generating part being movable in response to a movement of said roller.

15. (Currently amended): A manufacturing method of a semiconductor device, comprising the steps of:

grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate;

applying an attachment film onto the another principal surface of the semiconductor substrate; and

individualizing the semiconductor substrate into a plurality of semiconductor elements,

wherein the attachment film is laminated on the semiconductor substrate by pressing the attachment film placed on the another principal surface of the semiconductor substrate by a rotatable roller having a diameter of about 20-50mm, a heat-generating part therein and an elastically deformable resin layer on an outer surface thereof, and rolling the roller on the attachment film while generating heat by the heat-generating part while absorbing unevenness of the outer surface of the roller and unevenness of a surface of the film by elastic deformation of the elastically deformable resin layer; and

wherein said roller presses the film with a pressing load of 10-20N.

16. (Withdrawn): A manufacturing method of a semiconductor device, comprising the steps of:

grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate;

applying an attachment film onto the another principal surface of the semiconductor substrate; and

individualizing the semiconductor substrate into a plurality of semiconductor elements,
wherein the attachment film is laminated on the semiconductor substrate by pressing by a rotatable roller the attachment film placed on the another principal surface of the semiconductor substrate that is placed on a table provided with a plurality of heat-generating parts therein and rolling the roller on the attachment film while selectively causing the heat-generating parts to generate heat in response to a movement of the roller.

17. (Withdrawn): A manufacturing method of a semiconductor device, comprising the steps of:

grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate;

applying an attachment film onto the another principal surface of the semiconductor substrate; and

individualizing the semiconductor substrate into a plurality of semiconductor elements,
wherein the attachment film is laminated on the semiconductor substrate by pressing by a rotatable roller the attachment film placed on the another principal surface of the semiconductor substrate that is placed on a table for supporting the semiconductor substrate and rolling the roller on the attachment film while moving a heat-generating part provided under the table in response to a movement of the roller, the heat-generating part generating heat while moving.

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18. (New): The film lamination method as claimed in claim 1, wherein the difference in temperature between said heat generating part and said film during rolling is about 20°C.